UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

January 13, 2015

MEMORANDUM

Subject: Efficacy Review for EPA File Symbol 89492-2, Dutrion Tablet
DP Barcode: 421528

From: Microbiologist
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Antimicrobials Division (7510P)

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Regulatory Management Branch II
Antimicrobials Division (7510P)

Applicant: Dutrion North America LTD
P.O. Box 175
Ferintosh, Alberta
T0B 1M0 Canada

Formulation from the Label:

Active Ingredient(s)	% by wt.
Sodium Chlorite.....	20%
Other Ingredients.....	80%
Total.....	100%

I. BACKGROUND

The registrant, Dutrion North America, LTD has submitted efficacy data to add disinfectant and non-food contact surface sanitizer claims to the product, Dutrion Tablet (EPA Reg. No. 89492-2). The data package included a letter from the registrant's representative, Laird's Regulatory Consultants Inc., dated June 23, 2014, two efficacy studies (MRID 494141-01 and -02), statements of No Confidentiality Claims for both studies, and the proposed label. Studies were conducted at Accugen Laboratories, Inc., 50 West 75th Street Suit 209, Willow brook, Il 60527.

II. USE DIRECTIONS (proposed)

The product is a tablet which generates chlorine dioxide when prepared in clean water. Apply by mop, sponge, fogger or sprayer, ensuring visible wetness for specified contact time or apply through immersion or by clean-in-place application.

SANITIZER FOR HARD Non POROUS SURFACES:

Sanitizer at 50 ppm with an exposure time of 5 minutes. Make up Dutrion using the label instructions to produce a 2,000 ppm concentrate. Use a dilution device or sprayer to achieve a solution of 50 ppm. If diluting by hand, to create a 50 ppm solution, use 1 part Dutrion concentrate and dilute into 39 parts of clean water.

DISINFECTANT FOR HARD, NON-POROUS SURFACES:

Product may be used at 100 ppm with an exposure time of 5 minutes to disinfect hard surfaces. Make up Dutrion per label instructions to produce a 2,000 ppm concentrate. Dilute as necessary to product a solution of 100 ppm working solution. To create a 100 ppm solution, use 1 part Dutrion concentrate and 19 parts of clean water.

III AGENCY STANDARD FOR PROPOSED CLAIMS

Sanitizer Test (for inanimate, non-food contact surfaces): The effectiveness of sanitizers for non-food contact surfaces must be supported by data that show that the product will substantially reduce the numbers of test bacteria on a treated surface over those on an untreated control surface. The test surface(s) should represent the type(s) of surfaces recommended for treatment on the label, i.e., porous or non-porous. Products that are represented as "one-step sanitizers" should be tested with an appropriate organic soil load, such as 5 percent serum. Tests should be performed with each of 3 product samples, representing 3 different product lots, one of which is at least 60 days old against *Staphylococcus aureus* (ATCC 6538) and either *Klebsiella pneumoniae* (aberrant, ATCC 4352) or *Enterobacter aerogenes* (ATCC 13048 or 15038). The ASTM method states that the inoculum employed should provide a count of at least 7.5×10^5 colony forming units per carrier. Results must show a bacterial reduction of at least 99.9 percent over the parallel control within 5 minutes.

Disinfectants for Use on Hard Surfaces: The effectiveness of disinfectants for use on hard

surfaces must be substantiated by data derived using the AOAC Use-Dilution Method (for water soluble powders and liquid products) or the AOAC Germicidal Spray Products Test (for spray products).

New Performance Standard Criteria:

The current version of AOAC Methods 955.15 and 964.02 posted by AOAC on September, 19, 2013 should be used for testing. Refer to the Product Performance Test Guidelines (810.2200) for efficacy testing recommendations. For a hospital disinfectant product to be deemed effective, the following criteria apply:

- Each microbe should be tested three times. Each test should be conducted against a separate batch of product for a total of three batches. All three batches should be at the lower certified limit (LCL) of the active ingredient(s). Each of the three tests should be conducted on a different day. Testing at a single lab is acceptable. Thus, a total of three tests for *S. aureus* and three tests for *P. aeruginosa* are necessary. Sixty carriers are required per test, without contamination in the subculture media.
- The performance standard for *S. aureus* is 0-3 positive carriers out of sixty.
- The performance standard for *P. aeruginosa* is 0-6 positive carriers out of sixty.
- To be deemed an effective product, the product must pass all tests for both microbes.

IV. SUMMARY OF SUBMITTED STUDIES

1. MRID 494141-01 "Use Dilution Test for Testing Hard Surface Disinfectant Efficacy Testing" against *Staphylococcus aureus, Pseudomonas aeruginosa* and *Salmonella enterica*" for Dutrion Tablet (0.2% soution), by Tehseen Naqvi. Study conducted at Accugen Laboratories, Inc. Study date – March 6, 2014. Project Number: 1514-030614d.

This study was conducted against *Staphylococcus aureus* (ATCC 6538), *Pseudomonas aeruginosa* (ATCC 15442) and *Salmonella enterica* (ATCC 10708). Product lots of Dutrion Tablet were tested using the AOAC Use Dilution Test Method (on separate days) as described in the study protocol. The product was prepared by dissolving one tablet into a specified amount of sterile distilled water to prepare a 2000 ppm (0.2%) solution, which was further diluted with 950 ml of water to generate the test agent at 95 ppm (representing the LCL). Product was not tested in the presence of an organic soil load. Test cultures were initiated by inoculating a 10 mL tube (20 x 150 mm) of nutrient broth from a stock culture. One 10 µL certified transfer loop was used to transfer the inoculum from the stock culture into the broth. Three consecutive 24 ± 2 hour transfers by using 10 µL certified transfer loop were made in 10 mL nutrient broth incubated at 36 ±1°C. The previous 3-day sequences were repeated prior to the inoculation of the 48-54 hour test culture. Ten 25 x 150 mm tubes containing 20 mL nutrient broth were inoculated for the final subculture step and incubated for 48-54 hours at 36 ± 1°C. Carriers were exposed to test culture for 15 minutes and dried in a dry incubator at 37°C for 40 minutes. For each test organism, separate sets of dried inoculated carriers were exposed to 10 mL test substance. The carriers were allowed to remain in contact with the disinfectant for 5 minutes. Following the exposure period, the individual carriers were transferred to 10 mL of neutralizer and primary subculture recovery broth before transfer to secondary recovery broth. All subcultures were incubated for 48±2 hours at 36±1°C. Following incubation, the subcultures were examined for the presence or absence of visible growth. Three carriers were used to determine the average carrier counts per test organism. Controls included those for carrier population, purity, sterility, viability, and neutralization confirmation.

2. MRID 494141-02: "Standard Test Method for Efficacy of Sanitizers Recommended for Inanimate, hard, Nonporous, Non-Food Contact Surfaces," Test Organism: *Staphylococcus aureus* (ATCC 6538) and *Klebsiella pneumoniae* (ATCC 4352) for Dutrion Tablet (0.2% solution), by Tehseen Naqvi. Study conducted at Accugen Laboratories, Inc. Study date – April 22, 2014. Project Number 1514-030414d.

This study was conducted against *Staphylococcus aureus* (ATCC 6538) and *Klebsiella pneumoniae* (ATCC 4352). Product lots of Dutrion Tablet were tested using ASTM E1153-14 Standard Test Method for Efficacy of Sanitizers Recommended for Inanimate Non-Food Contact Surfaces as described in protocol number 786-032014d. The lots were tested against each of the target microorganisms for a contact time of 5 minutes. The product was prepared by dissolving one tablet into specified amount of sterile distilled water to prepare a 2000 ppm (0.2%) solution, which was further diluted with 950 ml of water to generate the test agent at 95 ppm. Product was not tested in the presence of an organic soil load. Five sterile glass carriers per product lot per organism were inoculated with a 48 hour old suspension of the test organism. The inoculum was spread to within 3 mm of the edges of the carrier. The carriers were dried at 37°C for 40 minutes. Dried carriers were transferred to individual 60 mL jars with sterile forceps. Using staggered intervals, 5.0 mL of prepared test substance was transferred to each jar. The carriers were allowed to expose for 5 minutes. Following exposure, 20.0 mL of neutralizer was transferred to the jars using identical staggered intervals. The carriers were rotated for about 50 rotations to suspend the surviving bacteria. Within 30 minutes of neutralization, 1 mL and 0.1 mL aliquots of the neutralized solution were plated onto the recovery agar plate medium. The plates were incubated for 48 hours at 37°C. Following incubation the subcultures were visually enumerated. Controls included those for carrier population control, carrier sterility control, neutralization confirmation, sterility, and purity.

V. RESULTS

Table 1. AOAC Use Dilution Test Results for Dutrion Tablets (3 lots)

MRID Number	Batch Reference Number	Organism		
		S. aureus	*P. aeruginosa*	*S. enterica*
494141-01	DNA5/13/A01S	1/60	1/60	0/60
	DNA8/13/B01S	0/60	1/60	0/60
	DNA11/13/C01S	1/60	1/60	1/60

VI CONCLUSIONS

1. The submitted efficacy data (MRID 494141-01) **support** the use of the product Dutrion Tablet as a disinfectant with bactericidal activity (when used according to directions for use) against *Staphylococcus aureus*, *Salmonella enterica*, and *Pseudomonas aeruginosa* on hard, non-porous surfaces with a contact time of 5 minutes and a pre-cleaning step. The study report pages 1 and 7 (of 13) identify Lot # DNA5/11/13/C01S as a tested lot of product, however information was provided by the registrant clarifying this error.

2. The submitted efficacy data (MRID 494141-02) **do not support** the use of the product Dutrion Tablet as a non-food contact surface sanitizer with activity against *Staphylococcus aureus* or *Klebsiella pneumoniae* with a contact time of 5 minutes. The tested product lots are unclear in the study report. The test lots identified throughout the study report differ (see study report pages 1, 6, 10, 15, 16 and 17). Therefore, the study does not meet the acceptance criteria for this guideline.

VII LABEL RECOMMENDATIONS

1. All sanitizer related claims should be removed from the proposed label.

2. The proposed label includes several uses that are not supported by hard, non-porous surface disinfection data. Public health uses included on the proposed label should be supported by the appropriate efficacy data.